

**ABSTRACT**

5 A thin film deposition method uses a vacuum confinement cup that employs a dense hot filament and multiple gas inlets. At least one reactant gas is introduced into the confinement cup both near and spaced apart from the heated filament. An electrode inside the confinement cup is used to generate plasma for film deposition. The method is used to deposit advanced thin films (such as silicon based thin films) at a high quality and at a high deposition rate.